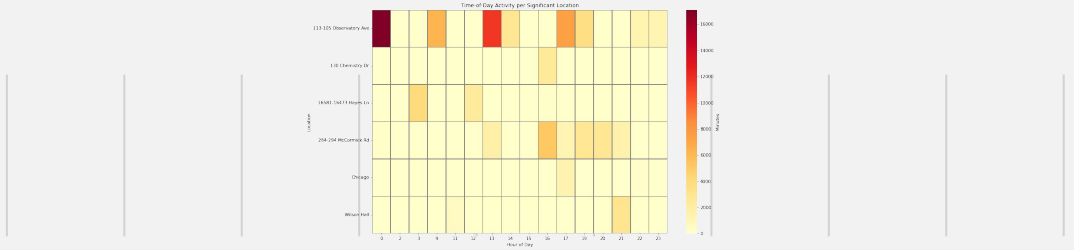
Analyzing Significant Locations with GPS Data

Objective: Identify and analyze significant locations (home, off-ground apartment, campus buildings) from personal Google Maps Timeline data collected between January and March 2025.



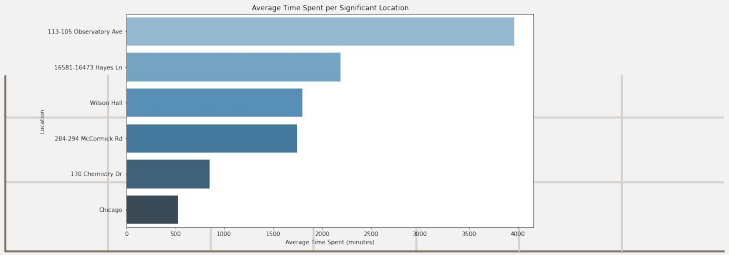
The Facts:

78 days
of GPS data analyzed (Jan 11–Mar 29, 2025).

~350
mins/day averaged at off-ground apartment.

1,000+
location points clustered to under 10 labeled clusters.

50+
Interactive routes mapped.



Methodologies:

Extracted GPS coordinates and visit durations from Google Maps Timeline.

Used DBSCAN clustering algorithm (15m radius, 2 points min.) to detect precise location clusters.

Labeled clusters using Google Places API (35m radius). Visualized routes and frequencies via Google Directions API and Folium.

Key Findings and Future Improvements:

Insights

Future Improvement #1
Accurate detection of routine patterns, e.g., late-night dorm activity.

Future Improvement #2
Confirmed potential for precise mobility tracking despite slight inaccuracies.

Key Finding #1
Off-ground apartment (113-105 Observatory Ave) most frequently visited location.

Key Finding #2
Other significant locations: Family home, campus locations (Wilson Hall, Clark Hall area), and Hilton Chicago (visited during NSBE Conference)..

Key Finding #3
Smaller clustering radius increased precision but introduced minor labeling errors.